Group 3

Team Members

Paul
Dick
Steve
Jared
Nancy
Jeff
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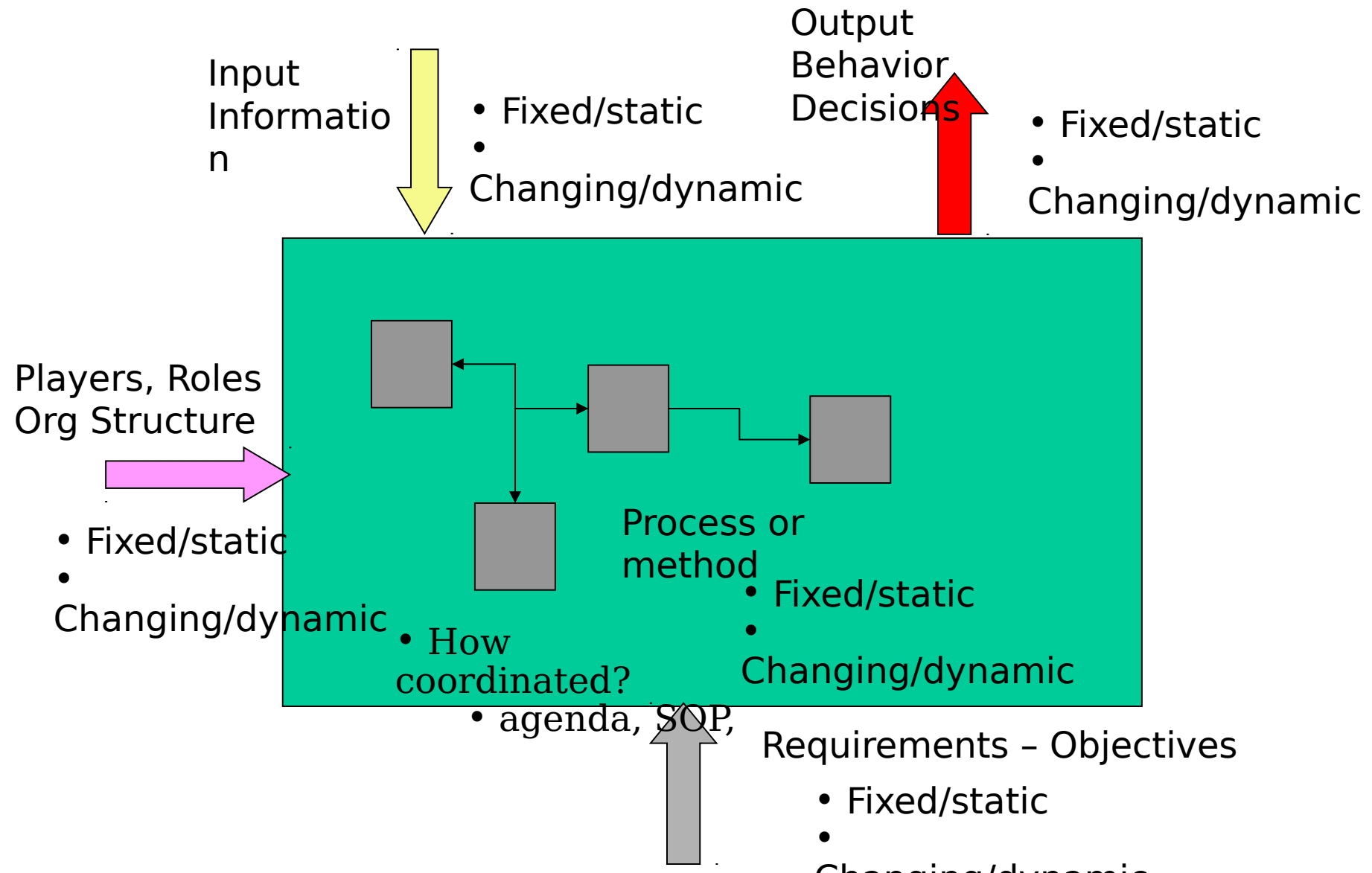
Collaboration vignettes

- Intelligence – Intact team of information retrievers, analysts, editor/supervisor responding to requests for information
- Operating room – Ad hoc team of nurse, surgeon, anesthesiologist, students
- Brigade TOC – 30 staff, of whom 6-8 are senior command (J2, J4, etc.) confronting dynamic input and dynamic objectives, short- and long-term objectives, generalists and specialists, multiple and complex tasks
- Joint Task Force – n participants engaged in forced coordination event followed by monitoring of others activities leading to conflict resolution and replanning using chat, email, phone, in-person

Gaps in research

- A general theory/model of collaborative group behavior
- Meta-requirements for theory
  - Generative
  - Falsifiable
  - Measurable
  - Generalizes along dimensions, below
- Answers these questions
    - How will changes to any of these parameters change group performance – speed, quality?
    - How robust is the group to changes in any of these parameter
      - Composition of team – expertise, number of players, heterogeneity (gender, cultural background) individual differences
      - Time frame of task, rhythm of task (tempo)
      - Cognitive overload – multiple tasks/person, stress, task complexity
      - Geographical – co-located vs distributed

Major Factors to be modeled in a general theory of collaborative teams



Gaps in methods

- Measures
  - Monitor how well the resource needs of each player are being satisfied wrt quantity and quality – e.g. track lags in resource allocation
  - Monitor the relevant cognitive load of each player
  - Monitor state and distribution of situation awareness (c.f., British Aerospace team SA tool)
  - Cognitive profiling tools to determine the optimal representation for a team or team member given the congruence of people (eg., cultural, psychological), mission tasks, etc.
- Cases
  - Corpus of common scenarios (a testbed) or
  - Classification of scenarios and focus within them
- Methods of mapping organizations and their missions to collaborative tools – measure weak points in collab activity and propose tools

Teaming opportunities

- Query DARPA Augmented Cognition to learn if their measurement tools can be reused in our studies
- Validate the EBR expert system in others' experiments
- Use UCSD data extraction tools to support analysis of others' experiments re: error analysis, error recovery, watch changes, staff replacement, etc.
  - Nancy Cooke is interested in this opportunity.
- DDD as distributed testbed for collaboration
- Ewall as testbed for collaboration monitors / alarms.
  - Aptima is interested in this.

Gaps in collaboration tools

- Analysis & Design tools
  - Successors to cognitive task analysis for a mission team
  - Tools that support selection of tools and/or tuneable tools
- Monitoring & Diagnosis
  - Cognitive workload monitors / alarms
  - Resource requirement monitors / alarms
  - Disagreement monitoring (rationale capture)
  - Synchronicity monitoring
  - Monitor state and distribution of situation awareness
- Execution / Remedies
  - Support for dynamic reallocation of subtasks
  - Synchronization support, better tools for coordination
  - Support for common assessment
  - Support for collaborative inference
  - Support for rapid propagation of accurate information

The End

Gaps in Research

- Time
  - Time frame
  - Tempo
  - Look-ahead available

- *Mission / tasks
  - Dynamism of the requirements = Degree of interaction between team and external organizations
  - Ill-definedness = whether problem, criteria, and solutions are defined
  - Multiplicity of objectives per task = conjunctive goals
  - Multiplicity of simultaneous tasks per role
  - Forecasting (planning) vs. Reacting (operations)
  - Explicit objectives
  - Dynamic vs. static input = batch vs. continuous input
  - Dynamic vs. static output

Gaps in Research

- Role definitions =
  - Degree of specialization = Variance in expertise = Distribution of expertise / role redundancy
  - Level of expertise
- Process
  - Degree of proceduralization
- *Structure
  - Dynamism of team members
  - Dynamism of roles
  - Individual differences between team members
  - Group composition = Heterogeneity on cultures, gender,
  - Size
  - Structure, e.g., Hierarchy
- Distribution – co-location, asychronicity
- Political requirements for collaboration = requirements for collaboration not driven by the tasks

Breakout Group Technical Discussion

Identify and discuss new approaches on how to empirically answer each research gap (e.g., gap = metrics to measure team shared understanding; approach = new communication protocol analysis techniques).

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Breakout Group Technical Discussion

Identify and discuss where current CKM projects could work jointly. Be as specific as possible.

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